North-South scientific cooperation: a view from the North[1]

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INTRODUCTION

In the South, more and more countries are benefiting from (foreign and national) investments to develop their higher education and research systems. North-South scientific cooperation policies have contributed to this development. But too many countries are still marginalised or so completely out of the running that their national higher education and their research facilities are in a state of steady decline. The large majority of the latter countries are on the African continent. Yet it is not for the lack of qualified scientists: quite the contrary, for their numbers and educational levels rose significantly during the 1970s and the 1980s. In the South (and the North) there is widespread sentiment that higher education and research are useless luxuries for the least developed countries and that there are faster roads to development. This can often be traced to the technicist theories that consider it adequate to train technicians to use technologies and knowledge designed elsewhere. However, experience has shown that nothing can replace a local scientific community (Gaillard, Krishna and Waast 1997).

While North-South scientific cooperation remains a relevant approach for strengthening the emergence and sustainable development of local scientific communities in the South, issues surrounding the research field have changed, among them, increased accountability. In the past, research scientists in many countries were marvellously free of political interference and were granted generous research budgets by the North (and sometimes also the South). Conditions were especially generous since the scientists could choose themes and make budgetary decisions on their own. Nowadays, these budgets are often allocated as part of programme plans and target-driven contracts negotiated with the State, which, more often than not, require results that will serve economic development. At the same time, the State "encourages" their scientists to negotiate research or consultancy contracts with the private sector in order to supplement their budget. Thus, regardless of the limits and the contradictions of these new requirements, scientists, both from the North and the South, must maintain a balance between research and expertise because competent and competitive expertise simply cannot exist in the absence of new strides in scientific knowledge and know-how.

Thus, although North-South scientific cooperation is as necessary as it was thirty, twenty or ten years ago, the context and the terms of the debate have changed considerably. In response, fresh thought must be given to the basis of scientific cooperation and research support policies, fields of intervention, organisational models, and the terms and conditions of "aid" and cooperation. Before critically reviewing the different models and

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1. This paper summarises some of the main findings of a recently published book (Gaillard, 1999). It has already been published as an article for the Encyclopedia of Life Support Systems EOLSS (theme section: Science and Technology Policy) under the title "Stakes and New Prospects for North-South Scientific Cooperation Policies".

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approaches, this paper discusses the legitimacy of North-South scientific cooperation and the possible consequences of the increasing privatisation of scientific activities for North-South scientific cooperation policies.

1. Scientific interference: legitimacy and duty

"The colonial enterprise", says Petitjean (1996), "used science to establish the legitimacy of a scenario in which science played the main role". The self-proclaimed superiority of the West since the 19th century was accompanied by a hierarchical ranking of civilisation and the altruistic obligation to spread Western civilisation with all its benefits. Even though the colonial period belongs to the past, the world is still divided, schematically, into two "poles". The second pole is subsidiary to the first pole, Western civilisation, whose superiority, whether we like it or not, comes from its growth-inducing scientific and technological capacities, its downstream innovation-generating techno-sciences, and a social organisation designed to serve scientific and technical development. Although the demarcation line between these two axes of civilisation is not unalterable, as long as the second pole countries lack a solid scientific and technological base of their own, they are more or less obliged to passively accept scientific knowledge and technical innovations from the West without being able to derive full benefits from them.

Does this dichotomy, and the "superiority" of one civilisation or model over another, justify having "development-oriented scientific research" for the South being conducted by scientists sent from the North? The fact that the South has recurring problems, *viz.* disease, malnutrition, environmental degradation, marginalisation, poverty, megapole management, etc. that could be solved through scientific research is often used as an argument to explain why scientific intervention is a sort of duty. The "development-oriented research" formula implies a close relationship between the results expected from this research and the development recommended by the societies involved. Hence, there are new foundations for justifying the presence of scientists from the North working in the South. However, this approach is only acceptable and, ultimately, legitimate if the scientific communities of the South request this scientific cooperation, and if the scientists from the North give due heed to the local representations and reference systems, so that local social and cultural values conveyed by colleagues from the South are properly incorporated in the knowledge construction systems. Thus, this development-oriented research requires shared partnership and common epistemological thought. Because of the dominating character of Western science and discrepant starting points, this is easier said than done. These inequalities can only be overcome if both sides revise their practices and methods.

Certain countries in the North, in an attempt to rebalance North-South cooperation in favour of the South and to ensure that values of the societies of the South are fully accommodated, recently decided to radically overhaul the policy governing their scientific cooperation with the South. This is the case in the Netherlands where a new policy adopted by the Ministry of Cooperation (DGIS) provides for resources from Dutch institutions to be transferred to their partners in the South and even allows the partners in the South, almost unilaterally, to determine research priorities for joint implementation. This new policy may jeopardise the active participation of the Dutch scientists, in particular their role in defining research priorities, and consequently challenges the legitimacy of the Dutch scientific community's work in the field of

development-oriented research. To work in the South, scientists from the North not only have to justify their presence in the South, they also have to increasingly demonstrate the value of their research for the development of both the country of the South and their own country, as well as to the public, colleagues, political decision-makers and the public budget administrators of their home country. This is particularly true for the United States, where a constant flow of communication to Congress and the American public is required to account for current and past programmes, that whilst contributing to finding solutions to development problems in the South, these programmes are also scientifically and economically profitable to the US and opening up new markets. In contrast, the IDRC (Canada) during the first two decades of its work tried mainly to respond to requests from the South but did not work hard enough on its national image. It was, at least partly, to make up for this visibility gap and, ultimately, insufficient legitimacy that IDRC tried to rally round the Canadian scientific community and, more recently, other Canadian partners by involving them more extensively. Thus, this question of legitimacy concerns all the countries of the North.

2. Is research for development public property?

The international scientific community operates according to standards that have made us accustomed to considering scientific knowledge as a universally available and universal asset. However, this state-supported public science is increasingly locking horns with market-driven private or privatised science. In today's globalised economy, the tendency now is to consider the capacity to create science as a commercial tool. Science was (and still essentially is) a public asset, although it is being turned into a private asset that may no longer be so readily shared, as private investment in research goes hand in hand with the demand for regulations that ensure property rights for the resulting scientific knowledge and technological innovation.

The global context fosters the search for competitiveness and tends to favour scientific production modes that generate immediate profit. The scientists' sense of professionalisation (Merton, 1973) is also altered, with a threat looming over the traditional values of professionalism, e.g. communalism (sharing results with one's peers) and selflessness (seeking academic recognition rather than personal economic gain). Research is increasingly being viewed as a short-term activity, and the obligation to publish, i.e. make one's work public, is gradually being replaced by the obligation to achieve appreciable and marketable results. Standards for the communication and publication of scientific output have also undergone substantial change: more and more PhD theses are defended behind closed doors, information circulates in confidential networks that connect private electronic boxes, many scientific discoveries are patented and presented to the media before specialised journals have reviewed them.

The globalised economy has relegated concerns for national interests, culture, and the need to share progress to a lower priority level. Many developmental goals that are unrelated to commercial interests, such as the search for equity, good living conditions and poverty control will probably be excluded from the worldwide scientific research agenda, which henceforth will be in private hands. The structural adjustment plans, based on the same predominant logic of globalisation and privatisation, have already forced many countries of the South, during their debt renegotiations, to agree to reducing public funding for work deemed not

directly productive. This often includes education (especially higher education) and research. Furthermore, institutions in the South (especially India, Mexico, Brazil, and many countries in Africa) frequently lose their senior technicians and scientists to private institutions (often multinational companies) where they anticipate enjoying a higher status and a better job.

But can private science exist and survive without public science? Private companies will probably not want to shoulder the cost of basic research since results are uncertain. On the other hand, assured results are essential to innovative companies. Moreover, as Callon (1996) wrote, "without public science, without this source of diversity, the market, which has a natural tendency to transform scientific knowledge into merchandise, will be condemned to even more self-penalising convergence and irreversibility". Because of its ultimate goal and its very nature, private science cannot create conditions propitious to generating the diversity and originality needed for scientific advancement and innovation. Callon (1996) concluded that science is a public asset that, as a source of variety, must be protected at all cost. This means that maintaining national public science is vitally important to both the private sector and the State for it alone can secure the level of autonomy which research groups and scientific communities need. The more numerous and heterogeneous these groups are, the more diversity they can generate. Public and private science must be complementary. How the alliances that bring together public and private science are and will be structured, depends on the proposals and the negotiating capacity of the people involved, i.e. research scientists, science policy officials, managers of private companies etc.

This observation will impact future scientific policies in both the North and the South; it will also affect the reorganisation of institutions (North) involved in implementing or assisting with development-oriented research. Several countries of the North, e.g. USA, Canada, Japan and United Kingdom, while decreasing their budgets for research cooperation with countries in the South, have increased technological cooperation agreements. This is particularly true for the USA and Japan. The European Union has drawn up new strategies to strengthen scientific/technological cooperation with emerging countries in order to help European business firms penetrate fast-growing markets. These cooperation agreements usually involve countries with strong techno-scientific potential. Development support policies should not overlook this turn of events. New types of agreements have paved the way for private companies to work with the best public laboratories in the emerging countries of the South. Since the middle of the 1980s, specialised institutions of the North, such as the Royal Institute for the Tropics (KIT) in the Netherlands, have revised their strategy and adopted a clearly commercial, client-oriented approach. In the United Kingdom, the Natural Resources Institute (NRI), which was privatised in 1996, has created two separate legal units, one for research activities and the other for consultancies. NRI staff can steer their careers between the two. The gradual decrease in direct funding for their activities is part of the reason for the change in strategy and status, and for staff reductions at both KIT and NRI. Although competition may sometimes be unfair, both institutions are ready to stand up to the challenge and feel they have certain comparative advantages, in particular through their capacity to provide limited term contracts, when need be, to specialists and experts drawn from the national scientific community or from abroad, and in particular, from the countries of the South.

3. Growing disparities requires different strategies

As the new century proceeds, the gap between countries of the North and the South is growing wider. Although it is always risky to project trends of the past into the future and there are still numerous areas of uncertainty and all the indicators suggest that the disparities will only continue to increase. But neither the North (since it is composed of countries with different performance levels and thus has its own "internal South") nor the South can be seen as an homogeneous entity. Some of the so-called emerging countries of the South are in the process of outperforming several countries of the North, both technologically and economically. Yet, the recent crises that have hit many of the countries in Asia and Latin America clearly remind us that the currently prevailing situation will not last forever. Furthermore, problems related to the size of the country and the critical mass of its scientific communities also have to be considered. The approach to a sub-continent like India, whose scientific output and community are almost as big as that of all the other countries of the South combined, must differ from the approach to countries who may have a population of under a million inhabitants and only a handful of scientists.

Obviously, strategies for such radically different situations and levels of scientific development cannot be the same. Researchers from scientifically more advanced countries can benefit fully from collaborative research programmes proposed by the North (which scientists from the North are especially willing to join if the partners from the South are scientifically prominent); but for many of the other countries of the South, this approach is only effective when combined with measures that contribute to local capacity building. This means training (or supplementary training) in research; institutional support, which usually takes time (procuring laboratory equipment, supplies, scientific journals etc.); tools for communications and networking; assistance in organising conferences; support for local scientific organisations; and other types of assistance that contribute to building up research groups and local scientific communities.

4. Models and approaches

The networks. **For more than twenty years, donor countries have been helping to create networks they hoped would strengthen research capacities in the South. Networking gained momentum in the 1980s, during the economic recession, partly because it was supposed to increase efficiency and partly because of the upsurge of new communication technologies (e.g. fax and e-mail). Donors are often enthusiastic about creating networks, which they see as a tool for working better and less expensively, and for sharing existing and new knowledge with an expanded community. Furthermore, networks make it possible for donors to support research in several countries at once without having to maintain direct contact with each one of them individually.**

International collaboration is becoming more intense in nearly all fields of research, but networking is probably the most highly developed in agriculture (Plucknett *et al.* 1990). The recent proliferation of research networks in the developing countries is making donors wonder about their intrinsic effectiveness and potential drawbacks. Experience has shown that it is often easier (or more appealing) to participate in a regional or international network than to work with colleagues at home.

Networks are often composed of very heterogeneous members which, as in North-South partnerships, brings up the question of asymmetric

relations among them. It is often the participants from the North who instigate the creation of the network, then manage it and run its activities which, indirectly, may deprive participants from the South of the chance to assume responsibility. Attention must also be given to preventing the network from becoming a work organisation system wherein some members work and other members net the profits.

The centres of excellence. This model is based on the observation that very few developing countries have a long-term capacity to organise and finance a critical mass of highly qualified research scientists at the national level and to provide them with the modern equipment they need. It was strongly supported in the scientific communities and, for many years, by the donors. There are many centres of excellence in the North. These were often started by concentrating resources and developing a particular area of expertise in a national institute or university and then later expanding this to the regional or international level. Experience also shows that in the developing countries the bottom-up approach works best, but that it is difficult to obtain sustained funding from governments in the South to create and operate these regional centres or centres of excellence. Most regional centres that have been created in the developing countries depend almost entirely on foreign financing and can barely survive without it.

The centres of the Consultative Group for International Agricultural Research (CGIAR) are a prototype of this system. They reflect the model of cooperation so popular in the 1960s and 1970s when the scientific problems of the developing countries were to be solved in cutting edge international laboratories. This system proved its worth by turning out research of a high quality. An informal donors group that met regularly ensured the financial stability of the system. The most frequent criticism launched at the CGIAR concerned its relations with the National Agricultural Research Systems (NARSs). Collaboration with the NARSs was implicit from the very early days of the CGIAR, but was not always satisfactory, partly because the NARSs were too weak. Efforts were made to improve the transfer of knowledge from the international centres to the NARSs and thus strengthen their research capacity. On the other hand, in some cases the CGIAR centres and other institutions specialising in development-oriented research are assigned objectives, *e.g.* research, cooperation and development, which prove difficult to reconcile. Remember that high-level (or cutting edge) research, and the results the scientists hope to publish in the leading international journals, is the product of competition and not only cooperation. This means that scientists in international centres with a concern for their own career paths may actually be competing with NARS scientists, especially the most advanced one.

Another version of this kind of model is to create a centre of excellence in the North and use networks to build up cooperation with national institutions and research groups in the South. This model was recently applied when the International Laboratory for Tropical Biology (ILTAB) was established in San Diego (California) through an agreement between the French Research Institute for Development (IRD, formerly ORSTOM) and the Scripps Research Institute (TSRI), a private American research institute. In record time ILTAB produced outstanding results on a scientific score and in research training for scientists from the South. This said, the centre is run by experienced scientists from the North and all its activities are financed by donors in the North. This model was designed in the North and is not readily transferable to the South, where it probably would not be technically, scientifically or financially viable. It pre-empted the

reorganisation currently underway in the global development-oriented research system that may well entrust certain vanguard research programmes for the South to various reputed centres of excellence in the North.

North-South partnership. **Many authors agree that the main problem in North/South joint programmes is unequal collaboration and the potential domination by the partner from the North. Speaking about Algerians' relations with foreign technical assistants, Khelfaoui (1996) said that the Algerians "reproach their foreign technical counterparts for maintaining a 'teacher-pupil' relationship while claiming they both have equal status, as is indicated by the widespread use of the term 'national counterpart'". Furthermore, certain difficulties experienced by partners in the South are indicative of the growing gap between the levels of scientific development amongst the developing countries. This has convinced several research support agencies, particularly SAREC in Sweden, to differentiate strategies according to the level of their partners' scientific development (see above).**

To ensure greater equality in North/South joint efforts requires recognition of the partners' unequal starting points. If this difference is not taken into account from the very beginning, negotiations will be conducted on the wrong basis with the brunt being borne at the project implementation stage. The question could be studied and then set out in an "international research convention" (Cambrezy 1996) or in a "charter of responsibilities" in North/South partnerships (Gaillard 1996). This would help to ensure equality during the various phases of the operation, from project design and definition to the publication of results and application of downstream benefits.

5. Institutional functions and models

The strong influence of history and national traditions has resulted in the creation of very different mechanisms and institutions for "supporting and conducting research in the South" and for "North-South research cooperation", by certain countries of the North. This is evident from the impact their respective colonial policies has had on systems established by Belgium, France, Netherlands, Portugal and United Kingdom. These countries established the first institutes specialising in tropical scientific research, the forerunners of many of today's institutes, which, together with specialised research teams (of various sizes), have accumulated knowledge of the field. Some of the most important and best known are (current names): the Natural Resources Institute (NRI) in the United Kingdom, the French Research Institute for Development (Institut de Recherche pour le Développement – IRD, formerly ORSTOM), the Centre for International Cooperation on Agricultural Research Development (le Centre de coopération internationale en recherche agronomique pour le développement - CIRAD), the Pasteur Institutes Overseas (les Instituts Pasteur Outre-Mer - IPOM) of France, The Royal Institute for the Tropics (KIT) in The Netherlands, the Institute for Tropical Scientific Research (IICT) in Portugal, and the Prince Leopold Institute for Tropical Medicine in Antwerp, Belgium.

Other countries like Canada, Sweden and Australia had no colonial past to draw on and, since the 1970s, have created specialised, centralised institutions for scientific and technical cooperation with the developing countries. These institutions serve as both strategic analysis and funding agencies. Canada created the International Development Research Centre

(IDRC) in 1970, Sweden created the Swedish Agency for Research Cooperation with the Developing Countries (SAREC) in 1975, and Australia created the Australian Centre for International Agricultural Research (ACIAR) in 1981.

Other countries like the United States, Germany and Japan preferred decentralised (even splintered) mechanisms that matched their respective political and administrative organisation and, at the same time, created hefty federal or national agencies to finance and implement the development-oriented joint efforts. The United States created the Agency for International Development (AID) in 1961; Germany created the German Agency for Technical Cooperation (GTZ) in 1975 (in its present form); and Japan created the Japanese Agency for International Cooperation (JICA) in 1974.

To one degree or another, these institutional systems serve three clearly distinct functions: 1) strategic analysis, policy orientation and coordination; 2) generation of knowledge; and 3) funding and logistical support.

These functions are assigned to one or several institutions. But in some cases, such as the ex-ODA (now DFID) in the U.K. and SIDA-SAREC in Sweden, an agency has been given responsibility for two functions (policy-making and funding for example).

The first function (strategic analysis, policy-making and coordination) is a political one played by a Ministerial Department or an agency under ministry control or, more generally, a somewhat autonomous inter-ministerial body. It does not necessarily require a high level of funding. Rawoo, for instance, which is essentially an advisory body for the Dutch government, has a small operational unit and limited resources but yet has decisive impact on the orientation of national (and European) policy. The reason for its success lies in its *ad hoc* capacity to form work groups comprised of qualified representatives from research, the users of research, and government. Yet, Rawoo does not have any formal responsibility in coordination, and could not have unless it were endowed with more staff and were given authority over research institutions and budgets.

The second function (generation of knowledge) falls within the purview of a whole range of institutions and individuals. This apparent dispersal is actually the fruit of history, particularly a period of colonial history when a variety of specialised institutions were gradually established. Some countries managed to pull these institutions together under a single organisation, e.g. the United Kingdom which placed all the British tropical research institutions, formerly headed by the ex-ODA, under the recently privatised Natural Resources Institute. This was not possible in other countries such as France where various attempts to merge, or at least partly combine, specialised institutions, in particular IRD (formerly ORSTOM) and CIRAD, were never concluded.

The main discourse across the international scientific community favours maximum participation by the national scientific community, such as the formation of (formal and informal) networks or inter-institutional units around federating scientific and thematic "poles". There are well-known and time-tested tools to achieve this aim, which mainly involve the introduction of a system for thematic calls for tender. This method has been used in most of the countries of the North with differing degrees of success. The calls for tender are part of a bevy of incentives that fall under the third function.

Different countries have different institutional arrangements for the last function (funding and logistical support). It is usually entrusted to a government agency (SIDA-SAREC in Sweden, AID in the US) or a ministry, for example DGIS/Dutch Ministry of Foreign Affairs and ex-ODA in the United Kingdom. However, there are examples of it being carried out by relatively autonomous funding agencies, e.g. IDRC in Canada, or even by efficient, influential independent private foundations, e.g. private foundations in America. Many agencies are responsible for both funding and coordination, *e.g.* SIDA-SAREC in Sweden, ex-ODA in U.K. The most efficient agencies are the ones that hire qualified scientists to run their programmes. The most innovative agencies have the thematic bidding process handled by scientists who are recognised and respected by their peers and who work in research institutions that have proven their federating capacities. Besides covering the management of incentives designed essentially to involve national scientific communities (in particular through the bidding process), this function includes providing additional resources and tools to fulfil conditions needed for a *bona fide* North-South partnership and for research capacity-building in the South. This entails giving institutional support, career integration assistance, support for teams being trained in the South, social integration, scientific communication and networking.

In many countries of the North, this function is not fully discharged. For historical reasons, countries like Sweden and Canada have not yet managed to mobilise their national scientific capacity at large. The reason is not always insufficient resources. Where the former colonial powers like France and the United Kingdom are involved, inadequate tools for partnership and research-support mechanisms in the South are usually to blame. Efforts are, however, being made in France to secure the resources needed to strengthen the national research systems in the South.

6. Coordination.

The soaring number of donor initiatives and the lack of coherency were criticised from the outset. This criticism was followed by suggestions for actions that would ensure inter-donor and donor-recipient coordination. One of the first efforts made at the institutional level dates back to the 1960s when OECD set up the Development Assistance Committee to coordinate its member countries' efforts and policies. Institutional level coordination is still not widespread, but the number of forums and *ad hoc* initiatives for coordinating donor initiatives has increased significantly over the last twenty years. Just to mention a few, the World Bank in Washington, like OECD in Paris, hosts the secretariats of donor clubs such as the Special Programme for African Agricultural Research (SPAAR) and the Consultative Group for International Agricultural Research (CGIAR). More recently, a donor network called "Bellanet" was established at the initiative of the Rockefeller Foundation, the World Bank, SIDA-SAREC and IDRC. The IDRC in Ottawa hosts its secretariat.

Besides improving overall effectiveness of aid, donor coordination also helps lighten the burden caused by large numbers of uncoordinated donor interventions and the management problems for the recipient institutions. However, there are certain obstacles to closer donor coordination. The most important one relates to the existence of a competitive donor culture. Even more important than donor coordination is the question of the interface between donors and recipients. Recipient defined needs and priorities should be the basis for donor coordination. In other words, the recipient institutions should be charged with coordinating the donors.

Similarly, whether the recipient is a country or an institution, they should also be required to work with the donors in defining a more unified system for reporting expenses and activities to the donor group as a whole.

The emergence of new geopolitical spaces has also contributed to creating integrated programmes keyed to strengthening development-oriented scientific cooperation. The European Union, for instance, has contributed to strengthening and creating European development-oriented research and improving coordination between the member states. Other projects, especially those led by the World Bank, seek to create a worldwide development-oriented research system

A growing capacity for European development-oriented research

In 1982, for the first time, the European Parliament allocated funds through its four-year budgetary plan specifically for scientific and technical activities designed to solve problems in the developing countries. A special programme entitled STD (Science and Technology for Development), then INCO-DC (International Cooperation with Developing Countries), was created to contribute to building up and strengthening a permanent European capacity for development-oriented research and to bring in partners from the South through multilateral networks and long-term joint operations.

The later programme, the future of which is now under threat, clearly contributed to the emergence of a European capacity. All the member countries are involved and initial differences are subsiding, although France, the United Kingdom and Belgium, who also have their own specialised institutions and scientific communities, are still among the most active members. This said, they do not have a disproportionate role in the programme; the participation of countries in both Northern Europe (Germany and the Netherlands in particular) and Southern Europe (mainly Spain, but also Italy and Portugal) is increasing significantly as can be seen by the number of institutions, especially universities, who are showing interest. Certain programmes led to the formation of European consortia, which enable the project's lead country to penetrate new countries. The size of the budgets usually restricts the size of the teams, often to just two members. Countries logically often develop preferred relations with a European partner, and count on reciprocity. To further this type of cooperation, several eminent institutions have built up coordinating mechanisms that have stood the test of time. Institutions, and often laboratories, have been more effective than national strategies in energising the programme.

Following STD2 and STD3 the European capacity for development-oriented research continued to grow stronger. The new EU strategy uses a sectoral approach that combines research and development, and aims to strengthen coordination between its instruments of economic and technological cooperation and its international programmes for scientific cooperation. The strategy seeks to improve efficiency in activities carried out jointly by the Commission and its member states (whether working at the international level or in a country of the South) and increase European visibility in this field. The coordinating bodies that are strongly supported by this new strategy include the European Initiative for Agricultural Research Development (EIARD), which has made the European contribution to the CGIAR stronger and clearer. Others, especially in the field of health, are in the planning stage. Coordinating bodies have also been created outside the EU at the initiative of prominent institutions in

the member states, e.g. the European Association of Development Research and Training Institutes (EADI), the European Consortium for Agricultural Research for the Tropics (ECART), the Network of European Agricultural Universities and Scientific Institutes Related with Agricultural Development (NATURA), and the Scientists for Health and Research for Development (SHARED). A synopsis of past experience convinced the EU that a more integrated approach based on support for science, and not only on joint S&T activities, would be needed for a well-reasoned implementation of both development and research policies. Through the STD programmes and then INCO-DC, the EU has successfully provided long-term support to joint scientific activities, and has thus contributed to building up a more modern European capacity for development-oriented research. But assistance to science includes far more than scientific cooperation alone. The European Union still needs an instrument able to better target support to research activities in the framework of a global strategy aimed at strengthening local capacities. Working on this concept, certain European countries, e.g. Sweden (who recently joined the EU) obtained encouraging results; their experience could be useful. Discussions are continuing to determine whether this renewed scientific aid policy falls within the province of the Union, its member states, or a more autonomous body supported by both the EU and its members and that could be set up as a resource agency or even a European Foundation for Research for Development.

A summary picture of European-supported thematic activities, geo-strategies, and budgetary changes, makes it clear that the European Union and its member states constitute the world's biggest development-oriented research capacity. Thanks to its complementarity, Europe covers a very broad, diversified spectrum of themes, disposes of various means for partnering and supporting research, and is active throughout the world, especially in Africa. Europe provides more than half of the world's total development aid and finances, close to half of the CGIAR's activities. Various European programmes have also contributed to strengthening and networking the European research capacity for cooperating with the South. Careful thought and discussion are being given to a development-oriented European research policy for the future. Over the last few years, several associations, consortia and coordinating bodies have been established, especially in the field of agriculture, health and the social sciences. However, Europe does not always stand united in international fora. The various components of a European "system" for research cooperation with the South are available, but the pieces have to be put together coherently. The emergence of an international or global system might be helpful since it would force Europe to take a real stand.

<u>The emergence of an international/global/worldwide system</u>?

As shown above, the world already has a time-tested international agricultural research system: CGIAR. Other attempts have been made to set up an international mechanism, e.g. for environment and health, using the same model. Up to now, these efforts have not been institutionalised. So once again, the system deemed "global" or "worldwide" is devoted only to agricultural research, with the World Bank in Washington hosting its secretariat. Besides coordinating the international agricultural research centres (CGIAR, whose secretariat is also at the World Bank in Washington) it covers the secretariat of the forum representing the NARSs, a forum of potential users of research results and a forum of

research institutions of countries of the North the so called advanced Research Institutions (ARI).

Much of the global system's research in biotechnology (especially cellular biology) requires an environment that would be increasingly difficult for the laboratories in the South to offer, even the ones in the international centres. Furthermore, senior scientists from the North are reluctant to work in international centres in the South as they may not be able to follow through on their research or secure property rights to their research findings. Consequently, the CGIAR is becoming increasingly dependent on the ARIs whose expertise and input are enhancing their role within the global system. One of the tasks facing the countries of the North, thus, is to identify and recognise the most efficient Northern ARIs participating in the global system. Major countries of the North have already found a vantage point for offering the services of their leading scientific establishments.

This change of events strengthens the role of the ARIs in the North and raises the debate on the evolution of approaches and concepts again. Although ARIs, hopefully, will contribute to advanced training for experienced scientists from the South, especially in the biotechnologies, by increasing the role of the ARIs from the North, the pendulum is clearly swinging in favour of the "problem-solving approach", which relegates the "research-capacity building in the South" to the back burner. This move towards an international division of scientific work that assigns research involving the most sophisticated equipment, to be used in the most competitive scientific environment, to a select number of ARIs from the North is probably justified from a "results only" vantage point. However, it may contribute to a further weakening of the research systems of the South. The urgency of problems facing research may justify this choice, but care must be taken not to make the North-South position within the global system even more asymmetric.

Many countries, in particular some of the smaller ones, turn to the international system to offset their weak national capacity in development-oriented research. Doomed to converge at some point, this trend, if pushed to the extreme, could lead to the creation of a single, unified system largely dominated by the North since the North would be providing most of the funds. This would be as harmful to the South as to the North. It is thus vitally important to protect the existing diversity, which is a source of creativeness, by maintaining and strengthening the various components of the emerging global system and by facilitating their interaction, rather than striving for unification.

CONCLUSION

While comparing policies, programmes and institutions established by the countries of the North we came to the conclusion that there is no single universally applicable system or model (Gaillard, 1999). Each model has grown out of each country's particular political, social and cultural history and has given rise to a country-specific network of institutions. Although concepts, models and approaches may blend into trends, trying to grow national systems into a single model is neither desirable nor realistic. Whilst efforts to develop an optimal configuration would be to no avail, the diversity of approaches and systems could be capitalised into complementarity. The search for complementarity has become vital, both at the national and the international levels, in these times of shrinking

public budgets for research and development. Moreover, complementarity is a source of wealth for all concerned.

Science itself should try to capitalise on - rather than ignore - the world's diversity of cultures. Working together, scientists from the North and the South should use this diversity to bring new problems to light and to formulate new research goals. If science is seeking to become universal, it has everything to gain from mutual exchanges, and will derive substance from the variety in lines of reasoning. The capacity for heuristic renewal depends on this cross-pollination, on a clearly comparative approach and on the diversity of epistemologies used.

North-South cooperation enriches this cross-pollination but it is often complicated by the unequal distribution of research resources. To compensate for this problem of worldwide asymmetry, the tools of cooperation and partnership must be complemented by research-support tools for local capacity building that lead to the formation of well-attended, dynamic and sustainable national scientific communities.

Lastly, North-South research projects require strong mutual interest and understanding, with each side having something to gain from the partnership. It entails truly negotiated cooperation, and not a one-way transfer, regardless of the direction. It is high time to turn the page and throw out the "donor-beneficiary" model that has dominated cooperation and research-assistance policies for the last forty years. The time has come to adopt a new paradigm that has been coined by Castillo (1994) as "interactive interdependence".

References

Callon M. (1996). La privatisation de la science est-elle inéluctable? In R. Waast (ed.), *Les sciences au sud: Etat des lieux*, Vol. VI, Les sciences hors d'occident au XXème siècle, Paris: ORSTOM éditions, 332 pages, pp.153-174.

Cambrezy L. (1996). "Chercher ailleurs ... Droit d'ingérence scientifique ou partenariat partagé?". In J. Gaillard (ed.), *Coopérations Scientifiques Internationales*, Vol.7, Les sciences hors d'occident au XXème siècle, Paris: ORSTOM éditions, 347 pages, pp.147-153.

Castillo G. T. (1994). "Interactive Interdependence: a New Paradigm for Development Research". In Schweigman, C. and I.A. van der Werf (eds.). 1994. *Development-related research collaboration: A second look at the role of the Netherlands*, Amsterdam: Royal Policy Institute, pp.124-134.

Gaillard J. (1994). "North-South Research Partnership: Is Collaboration Possible between Unequal Partners?". *Knowledge and Policy*, Vol.7(2), pp.31-63.

Gaillard J. (1996). Les collaborations scientifiques Nord-Sud: un examen critique de huit programmes d'aide à la recherche. In J. Gaillard (ed.), *Coopérations Scientifiques Internationales*, Vol.7, Les sciences hors d'occident au XXème siècle. Paris:ORSTOM éditions, 347 pages, pp.219-253.

Gaillard J., V.V. Krishna and R. Waast (eds). (1997). *Scientific Communities in the Developing World*. New Delhi: SAGE, 398 pages.

Gaillard J. (1999). La coopération scientifique et technique avec les pays du Sud. Peut-on partager la science? Paris: Khartala, 340 pages. This book draws on a survey of S&T cooperation policies in six countries of

the North, viz. Canada, Japon, the Netherlands, Sweden, the United-Kingdom and the United States.

Khelfaoui H. (1996). "La Coopération technique internationales: acteurs et institutions (le cas du pôle technologique de Boumerdès)". In J. Gaillard (Ed.), *Coopérations Scientifiques Internationales*, Vol.7, Les sciences hors d'occident au XXème siècle, Paris:ORSTOM éditions, 347 pages, pp.187-201.

Krishna V.V., R. Waast and J. Gaillard. (1998). Globalization and scientific communities in developing countries, *World Science Report 1998*. Paris: Unesco, 300 pages, pp.294-299.

Merton R.K. (1973). *The Sociology of Science. Theoretical and Empirical Investigations.* Chicago: The University of Chicago Press.

Petijean P. (éd.). (1996). *Les Sciences Coloniales. Figures et Institutions*. Paris: ORSTOM éditions, 353 pages.

Plucknett D.L., N.J.H. Smith and S. Ozgediz. (1990). *Networking in International Agricultural Research*. Ithaca and London: Cornell University Press.

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